

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Date: July 21, 2003

In re Application of:
DAVID J. EDLUND, WILLIAM A. PLEDGER
and R. TODD STUDEBAKER

Filed : July 21, 2003

For : HYDROGEN-SELECTIVE METAL MEMBRANES,
MEMBRANE MODULES, PURIFICATION ASSEMBLIES
AND METHODS OF FORMING THE SAME

Commissioner for Patents
PO Box 1450
Alexandria, Virginia 22313-1450

S i r:

INFORMATION DISCLOSURE STATEMENT
UNDER 37 C.F.R. § 1.56

Pursuant to Applicants' duty of disclosure required under 37 C.F.R. § 1.56, Applicants are submitting the enclosed, completed PTO forms 1449 as required by 37 C.F.R. § 1.97 and 1.98. The filing of this Information Disclosure Statement should not be construed as a representation that a search has been made or as an admission that the listed references are prior art for this application. Applicants respectfully request that the listed references be expressly considered during prosecution of the application, and that the references be made of record therein and appear among the "references cited" on any patents issuing therefrom.

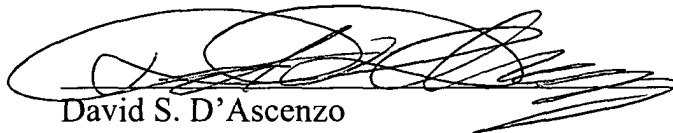
This Information Disclosure Statement includes 11 pages of PTO-1449 forms; however, it does not include copies of the references listed on

the forms, as permitted under 37 C.F.R. § 1.98(d), because copies already were provided in an earlier U.S. application (Serial No. 10/196,329, now U.S. Patent No. 6,596,057), or a priority application thereto, that is relied on here for an earlier effective filing date under 35 U.S.C. § 120.

For each foreign document for which there is no translation, a concise statement of relevance or an English language abstract is already of record in the previously cited patent and applications identified above.

Applicants recognize that there are many references listed in the enclosed PTO 1449 Forms. However, Applicants have prosecuted, and are prosecuting dozens of applications related to the field of fuel processing systems and fuel cell systems. Accordingly, Applicants have received quite a volume of references and frequently receive new information from Applicants' own searches, the U.S. Patent and Trademark Office and foreign patent offices. Applicants appreciate in advance the Examiner's time and understanding.

Respectfully submitted,
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FORM PTO-1449		DOCKET NUMBER		APPLICATION NUMBER			
INFORMATION DISCLOSURE CITATION IN AN APPLICATION		NPW 304E					
		APPLICANTS DAVID J. EDLUND, WILLIAM A. PLEDGER and R. TODD STUDEBAKER					
		FILING DATE July 21, 2003		GROUP ART UNIT			
U.S. PATENT DOCUMENTS							
EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS	FIL. DATE IF APPROP.	
	2,824,620	2/25/1958	De Rosset				
	3,208,198	9/28/1965	Rubin				
	3,344,586	10/3/1967	Langley et al.				
	3,336,730	8/22/1967	McBride et al.				
	3,350,176	10/31/1967	Green et al.				
	3,356,538	12/5/1967	Miekka et al.				
	3,368,329	2/13/1968	Eguchi et al.				
	3,428,476	2/18/1969	Langley et al.				
	3,439,474	4/22/1969	McKinley				
	3,447,288	6/3/1969	Juda et al.				
	3,450,500	6/17/1969	Setzer et al.				
	3,469,372	9/30/1969	Yamauchi et al.				
FOREIGN PATENT DOCUMENTS							
	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB CLASS	TRANSLATION YES NO	
	JP 45-14404	5/1970	Japan				X
	JP 45-2642	9/1970	Japan				X
OTHER DOCUMENTS							
	English abstract of Japanese Patent No. 1-262903, 1989.						
	English abstract of Japanese Patent No. 432150, 1992.						
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EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS	FIL. DATE IF APPROP.
	3,469,944	9/30/1969	Bocard et al.			
	3,486,301	12/30/1969	Bonnet			
	3,520,803	7/21/1970	Iaconelli			
	3,534,531	10/20/1970	Eguchi et al.			
	3,564,819	2/23/1971	Neulander et al.			
	3,665,680	5/30/1972	Heuser			
	3,713,270	1/30/1973	Farr et al.			
	3,761,382	9/25/1973	Hammond et al.			
	3,839,110	10/1/1974	Shankoff			
	3,849,076	11/19/1974	Gryaznov et al.			
	3,881,891	5/6/1975	Goltsov et al.			
	3,881,897	5/6/1975	Faure et al.			
FOREIGN PATENT DOCUMENTS						
	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB CLASS	TRANSLATION YES NO
	JP 1-145302	6/1989	Japan			
	JP 1-145303	6/1989	Japan			
OTHER DOCUMENTS						
	English abstract of Japanese Patent No. 513230, 1993.					
	English abstract of Japanese Patent No. 514790, 1993.					
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	3,972,695	8/3/1976	Buckley et al.			
	4,003,725	1/18/1977	Bunn, Jr. et al.			
	4,056,373	11/1/1977	Rubin			
	4,078,985	3/14/1978	Takeuchi			
	4,132,668	1/2/1979	Gryaznov et al.			
	4,197,152	4/8/1980	Palty et al.			
	4,238,403	12/9/1980	Pinto			
	4,248,688	2/3/81	Gartner et al.			
	4,254,086	3/3/1981	Sanders			
	4,313,013	1/26/1982	Harris			
	4,319,923	3/16/1982	Falanga et al.			
	4,329,157	5/11/1982	Dobo et al.			
FOREIGN PATENT DOCUMENTS						
	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB CLASS	TRANSLATION YES NO
	JP 1-262903	10/1989	Japan			
	JP 6-134244	5/1994	Japan			
OTHER DOCUMENTS						
	English abstract of Japanese Patent No. 604070, 1994.					
	English abstract of Japanese Patent No. 634540.					
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	4,331,520	5/25/1982	Juda et al.				
	4,422,911	12/27/1983	Juda et al.				
	4,468,235	8/28/1984	Hill				
	4,472,176	9/18/1984	Rubin				
	4,589,891	5/20/1986	Iniotakis et al.				
	4,650,814	3/17/1987	Keller				
	4,654,063	3/31/1987	Auvil et al.				
	4,655,797	4/7/1987	Iniotakis et al.				
	4,684,581	8/4/1987	Struthers				
	4,713,234	12/15/1987	Weirich et al.				
	4,810,485	3/7/1989	Marianowski et al.				
	4,849,187	7/18/1989	Uozu et al.				
FOREIGN PATENT DOCUMENTS							
	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB CLASS	TRANSLATION YES NO	
	WO 97/43796	11/1997	WIPO				X
	WO 99/30806	6/1999	WIPO			X	
OTHER DOCUMENTS							
	English abstract of Japanese Patent No. 710910, 1995.						
	English abstract of Japanese Patent No. 11116202, 1999.						
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	4,981,676	1/1/1991	Minet et al.			
	4,999,107	3/12/1991	Guerif			
	5,126,045	6/30/1992	Kohlheb et al.			
	5,139,541	8/18/1992	Edlund			
	5,158,581	10/27/1992	Coplan			
	5,205,841	4/27/1993	Vaiman			
	5,215,729	6/1/1993	Buxbaum			
	5,217,506	6/8/1993	Edlund et al.			
	5,225,080	7/6/1993	Karbachsch et al.			
	5,229,102	7/20/1993	Minet et al.			
	5,259,870	11/9/1993	Edlund			
	5,326,550	7/5/1994	Adris et al.			
FOREIGN PATENT DOCUMENTS						
	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB CLASS	TRANSLATION YES NO
	WO 00/27507	5/2000	WIPO			X
	WO 01/03086	1/2001	WIPO			X
OTHER DOCUMENTS						
		Adris, A. M., et al., "A Fluidized Bed Membrane Reactor for the Steam Reforming of Methane," The Canadian Journal of Chemical Engineering, Vol. 69, pp. 1061-70 (October, 1991).				
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	5,354,547	10/11/1994	Rao et al.			
	5,376,167	12/27/1994	Broutin et al.			
	5,393,325	2/28/1995	Edlund			
	5,449,848	9/12/1995	Itoh			
	5,498,278	3/12/1996	Edlund			
	5,500,122	3/19/1996	Schwartz			
	5,509,942	4/23/1996	Dodge			
	5,518,530	5/21/1996	Sakai et al.			
	5,520,807	5/28/1996	Myrna et al.			
	5,525,322	6/11/1996	Willms			
	5,536,405	7/16/1996	Myrna et al.			
	5,612,012	3/18/1997	Soma et al.			
FOREIGN PATENT DOCUMENTS						
	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB CLASS	TRANSLATION YES NO
	EP 1065741 A2	1/3/2001	EPO			X
	WO 01/28662	4/2001	WIPO			X
OTHER DOCUMENTS						
	Amphlett, J. C., et al., "On Board Hydrogen Purification for Steam Reformer/PEM Fuel Cell Vehicle Power Plants," Energy Progress X, Proceedings of the 10 th World Hydrogen Energy Conference, Cocoa Beach, Florida, U.S.A., Vol. 3, pp. 1681-90 (June, 1994).					
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	5,637,259	6/10/1997	Galuszka et al.			
	5,639,431	6/17/1997	Shirasaki et al.			
	5,645,626	7/8/1997	Edlund et al.			
	5,658,681	8/19/1997	Sato et al.			
	5,705,082	1/6/1998	Hinson			
	5,705,916	1/6/1998	Rudbeck et al.			
	5,734,092	3/31/1998	Wang et al.			
	5,738,708	4/14/1998	Peachey et al.			
	5,782,960	7/21/1998	Ogawa et al.			
	5,814,112	9/29/1998	Elliot et al.			
	5,821,185	10/13/1998	White et al.			
	5,858,314	1/12/1999	Hsu et al.			
FOREIGN PATENT DOCUMENTS						
	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB CLASS	TRANSLATION YES NO
OTHER DOCUMENTS						
		Amphlett, J. C., et al., "Simulation of a 250 kW Diesel Fuel Processor/PEM Fuel Cell System," Fifth Grove Fuel Cell Symposium, Commonwealth Institute, London, U.K., p. 8 (September 22-25, 1997).				
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	5,861,137	1/19/1999	Edlund			
	5,888,273	3/30/1999	Buxbaum			
	5,904,754	5/18/1999	Juda et al.			
	5,931,987	8/3/1999	Buxbaum			
	5,938,800	8/17/1999	Verrill et al.			
	5,997,594	12/7/1999	Edlund et al.			
	6,103,028	8/15/2000	Juda et al.			
	6,152,995	11/28/2000	Edlund			
	6,168,650	1/2/2001	Buxbaum			
FOREIGN PATENT DOCUMENTS						
	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB CLASS	TRANSLATION YES NO
	OTHER DOCUMENTS					
		Chai, M., et al., "Promotion of Methane Steam Reforming Using Ruthenium-Dispersed Microporous Alumina Membrane Reactor," Chemistry Letters, The Chemical Society of Japan, pp. 41-44 (1993).				
		"Compact, Lightweight Fuel Reformer for Fuel Cells," Argonne National Laboratory/U.S. Department of Energy (July, 1996).				
		Edlund, Dr. David and William Pledger, "Development of a Compact and Economical Steam Reformer for Fuel-Cell Systems," Fifth Grove Fuel Cell Symposium, Commonwealth Institute, London, U.K., p. 6 (September 22-23, 1997).				
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	6,171,574	1/9/2001	Juda et al.			
	6,183,542	2/6/2001	Bossard			
	6,183,543	2/6/2001	Buxbaum			
	6,221,117	4/24/2001	Edlund et al.			
	6,238,465	5/29/2001	Juda et al.			
FOREIGN PATENT DOCUMENTS						
	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB CLASS	TRANSLATION YES NO
OTHER DOCUMENTS						
		Edlund, David J. and William A. Pledger, "The Practical Use of Metal-Membrane Reactors for Industrial Applications," The 1995 Membrane Technology Reviews, pp. 89-97 (November, 1994).				
		Emonts, B., et al., "Compact Methanol Reformer Test for Fuel-Cell Powered Light-Duty Vehicles," Fifth Grove Fuel Cell Symposium, Commonwealth Institute, London, U.K., p. 42 (September 22-25, 1997).				
		Emonts, B., et al., "Compact Methanol Reformer Test for Fuel-Cell Powered Light-Duty Vehicles," Fifth Grove Fuel Cell Symposium, Commonwealth Institute, London, U.K., (no page no.), (September 22-25, 1997).				
		Jørgensen, S. Lægsgaard, et al., "Application of Pd-Membranes for the Production of Pure Hydrogen in Methanol-Based Fuel Cell Powered Vehicles," Proceedings of Fourth Workshop: Optimisation of Catalytic Membrane Reactor Systems, ESF Network, Catalytic Membrane Reactors, Oslo, Norway, pp. 51-57 (May 30-31, 1997).				
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	6,319,306	11/20/2001	Edlund et al.			
	6,332,913	12/25/2001	Breitschwerdt et al.			
	6,340,380	1/22/2002	Frost et al.			
	6,350,297	2/26/2002	Doyle et al.			
	6,395,405	5/28/2002	Buxbaum			
	6,419,726	7/16/2002	Frost et al.			
	6,419,728	7/16/2002	Edlund			
	6,458,189	10/1/2002	Edlund et al.			
FOREIGN PATENT DOCUMENTS						
	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB CLASS	TRANSLATION YES NO
OTHER DOCUMENTS						
		Knapton, A. G., "Palladium Alloys for Hydrogen Diffusion Membranes," Platinum Metals Review, Vol. 21, 44-50 (1977).				
		Ledjeff-Hey, K., et al., "Compact Hydrogen Production Systems for Solid Polymer Fuel Cells," Fifth Grove Fuel Cell Symposium, Commonwealth Institute, London, U.K., p. 17 (September 22-25, 1997).				
		Menzer, R., et al., "Fuel Processing in Fuel Cell Systems for Mobile Applications - Gasoline as Energy Carrier On-Bord," Fifth Grove Fuel Cell Symposium, Commonwealth Institute, London, U.K., (no page no.), (September 22-25, 1997).				
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	6,461,408	10/8/2002	Buxbaum			
	6,475,268	11/5/2002	Thornton			
	6,494,937	12/17/2002	Edlund et al.			
	2002/0124723	9/12/2002	Frost et al.			
	2002/0187089	12/12/2002	Buxbaum			
FOREIGN PATENT DOCUMENTS						
	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB CLASS	TRANSLATION YES NO
OTHER DOCUMENTS						
		Minet, R. G., et al., "Experimental Studies of A Ceramic Membrane Reactor for the Steam/Methane Reaction at Moderate Temperatures (400-700°C)," Symposium on Natural Gas Upgrading II Presented before The Division of Petroleum Chemistry, Inc., Meeting of American Chemical Society, San Francisco, California, U.S.A., pp. 245-48 (April, 1992).				
		Oertel, Michael, et al., "Steam Reforming of Natural Gas with Integrated Hydrogen Separation for Hydrogen Production," Chemical Engineering Technology, Vol. 10, pp. 248-55 (1987).				
		Shu, J., et al., "Catalytic Palladium-Based Membrane Reactors: A Review," The Canadian Journal of Chemical Engineering, Vol. 69, pp. 1036-60 (October, 1991).				
		Teagan, W. P., et al., "Cost Reduction of Fuel Cells for Transportation Applications—Fuel Processing Options," Fifth Grove Fuel Cell Symposium, Commonwealth Institute, London, U.K. (September 22-25, 1997).				
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